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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/193,058	11/16/1998	ALBERT S. FENG	22010-127	1589

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INDIANAPOLIS, IN 462045137

EXAMINER
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GRAHAM, ANDREW R

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/193,058

Applicant(s)

FENG ET AL.

Examiner

Andrew Graham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 34, 35, 37-42, 44-48, 50-54 and 56-66 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 34, 35, 37-42, 44-48, 50-54 and 57-61 is/are allowed.
- 6) ☒ Claim(s) 62-65 is/are rejected.
- 7) ☒ Claim(s) 56 and 66 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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**DETAILED ACTION**

***Terminal Disclaimer***

1. The terminal disclaimer filed on June 1, 2004 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of the statutory term of prior patent number 6,222,927 has been reviewed and is accepted. The terminal disclaimer has been recorded.

***Inventorship***

2. In view of the papers filed 12/12/2003, the inventorship in this nonprovisional application has been changed by the deletion of Robert C. Bilder and Douglas L. Jones.

The application will be forwarded to the Office of Initial Patent Examination (OIPE) for issuance of a corrected filing receipt, and correction of Office records to reflect the inventorship as corrected.

***Response to Amendment***

3. The declaration filed on January 31, 2005 under 37 CFR 1.131 is sufficient to overcome the Bhadkamkar reference. Accordingly, the previous rejection(s) made in view of this reference have been withdrawn.

As the previous rejection(s) made in view of Bhadkamkar have been withdrawn at least in view of the declaration filed on January 31, 2005 under 37 CFR 1.131, further arguments and the declaration filed on January 31, 2005 under 37 CFR 1.131 are considered moot.

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***Claim Objections***

4. **Claim 56** is objected to because of the following informalities: - Claim 56 claims dependency upon Claim 1, which has been cancelled.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. **Claim 62** is rejected under 35 U.S.C. 102(e) as being anticipated by Cezanne et al (USPN 5473701), hereafter "Cezanne".

Cezanne teaches an adaptive microphone array that addresses the direction of received signals from both desired and undesired sources.

Regarding **Claim 62**, Cezanne teaches:

A method of signal processing ("adaptive attenuation", col. 2, lines 49-62), comprising:

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detecting an acoustic excitation ( $s(t)$ ) at both a first location (position of 10) to provide a corresponding first signal output of 10 to 14) and at a second location (12) to provide a corresponding second signal (output of 12 to 16) (col. 4, lines 38-49, Figure 3),

the excitation ( $s(t)$  from) being a composite of a desired acoustic signal from a first source and an interfering acoustic signal from a second source spaced apart from the first source (desired and undesired sound impinges on the array, col. 3, lines 1-4; array comprises the two microphones 10,12, col. 4, lines 39-45);

selecting the desired acoustic signal (sound from DS) by positioning a reference axis (from A along angle  $\theta$ , Figure 1a-1c) relative ( $-90 < \theta < 90$ ) to the first source (DS) (desired source arrives from foreground, which is defined based direction from A along angle  $\theta$ , col 3, lines 1-20);

localizing (association of location, "angular orientation of a directivity pattern null", col. 5, lines 46-58) the second source (location of null is coincident and automatically adjusted based on minimizing noise from NS, thus null angle associates location to NS, col. 3, lines 27-30; col. 5, lines 44-46) relative to the reference axis (nulls occur within  $-160^\circ < \theta < 120^\circ$  or  $-90^\circ < \theta < 90^\circ$ ), as a function of the first and second signals (null adaptation is based on array output ( $C_F, C_B$ ), col. 5, lines 60-61), and

generating a characteristic signal ( $y(t)$ ) representative of the desired acoustic signal (sound from DS in foreground, uniform sensitivity in foreground, col. 3, lines 24-27; col. 5, lines 38-44)

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during performance of said localizing (continuous update of null, null tracking, col. 7, lines 7, lines 3-13).

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. **Claims 63-65** are rejected under 35 U.S.C. 103(a) as being unpatentable over Cezanne as applied to claim 62 above, and further in view of Knowles (USPN 3770911).

As detailed above, Cezanne teaches an adaptive microphone array that addresses the direction of received signals from both desired and undesired sources.

Regarding **Claim 63**, Cezanne teaches:

defining the reference axis (from A along angle  $\theta$ ) relative to the first location and the second location (position of 10,12 spaced apart by d as part of array; implicit that 10 is in front half plane of array, and thus foreground, while 12 is in rear half plane, thus, background, by virtue of formation of "front" and "back" cardioid signals and use of delays, col. 4, lines 56-63; col. 5, lines 41-49; array is oriented such that desired sound (at  $\theta$ ) impinges from background, col. 3, lines 1-4);

Cezanne does not clearly specify:

- moving the reference axis

Knowles teaches the use of a directional microphone in a hearing aid.

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Specifically regarding **Claim 63**, Knowles teaches:

moving the reference axis ("turning head in direction of source", in view of Cezanne's definition of  $\theta$  relative to a "foreground", such as  $-45^\circ < \theta < 45^\circ$ ; col. 1, lines 16-27; directional sensitivity of Knowles, col. 3, lines 41-45)

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the directional microphone into a hearing aid system, wherein a user may turn his or her head. The motivation for incorporation into a hearing aid would have been to enable a hearing aid user to sense the direction of a source of sound among several simultaneous sources. The turning of the head, or relative realignment of the foreground in the context of Cezanne, would have enabled the user to distinguish the source of sound with the aid of his or her visual sense.

Regarding **Claim 64**, Cezanne discloses:

the detecting the acoustic excitation is performed with a first sensor (10) at the first location (position of 10, d spacing from 12) and a second sensor (12) at the second location (position of 12 d spacing from 10) (col. 4, lines 43-49).

Regarding **Claim 65**, Knowles discloses:

wherein the method (directional) is performed with a hearing aid (col. 2, lines 43-45; col. 3, lines 46-50).

***Allowable Subject Matter***

7. Claims 34-35, 37-42, 44-48, 50-54, 57-61 are allowed.

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8. **Claim 66** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 571-272-7517. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564.



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The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ag  
June 13, 2005



**SINH TRAN**  
ADVISORY PATENT EXAMINER

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~~ADVISORY PATENT EXAMINER~~